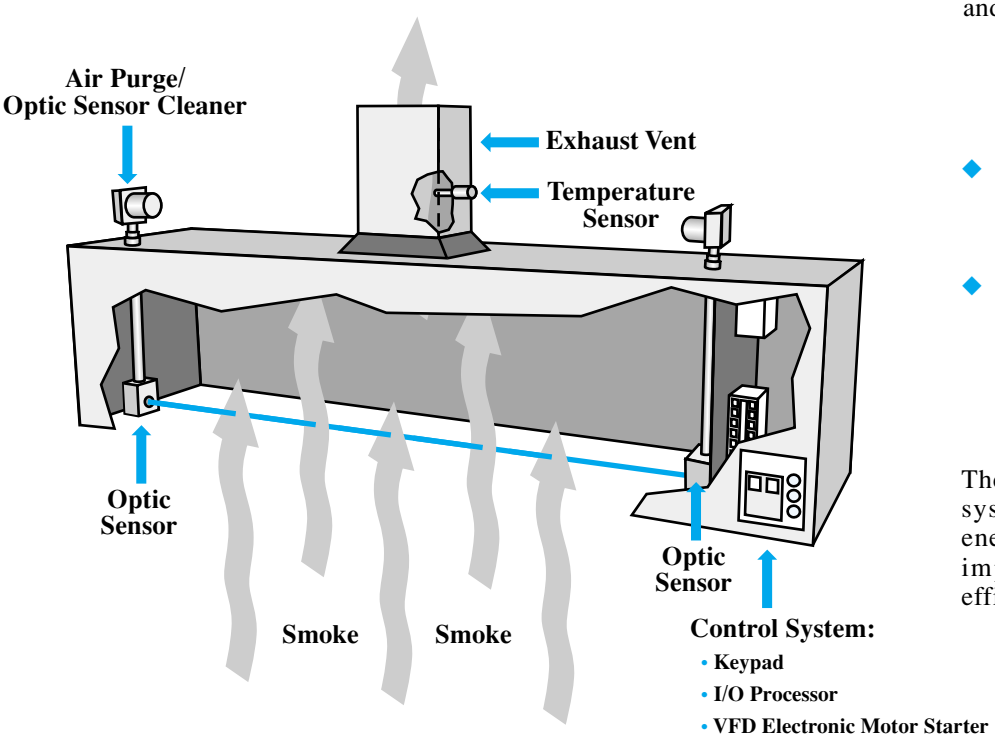
# Restaurant Exhaust Ventilation Monitor/Controller

## New Kitchen Exhaust System Uses Variable Speed Controls to Save Energy

Typical exhaust hoods in restaurants operate at full speed all day long and sometimes all night long even when cooking is not taking place. With assistance from DOE's Inventions and Innovation Program, Melink Corporation developed a microprocessor-based controller for commercial kitchen ventilation systems. The controller optimizes system performance for four key parameters: kitchen comfort, fire safety, occupant health, and energy efficiency. The controller uses an intelligent code that continually analyzes an array of operational inputs and provides an output signal to variable-frequency speed drive (VFD) electronic motor starters, which then vary the speed of the exhaust and makeup fans.

The main control system includes a keypad that provides bypass capability and preset functions such as minimum fan speed, temperature span, and monitoring. The input/output (I/O) processor continuously reads inputs from the optic and temperature sensors that monitor heat and smoke levels from cooking activity. The air purge units prevent grease vapors from collecting on the optic sensor lenses to ensure trouble-free operation.

When cooking needs are low, the sensors prompt the processor to maintain low preset fan speeds, which provides fan motor energy savings. When the sensors identify smoke or temperature levels above preset limits, the processor prompts the electronic motor starter to increase the exhaust fan speed to accommodate increased ventilation needs. When cooking needs are reduced, the sensors prompt the processor to again reduce fan speeds to energy-saving levels.




*The Melink Restaurant Exhaust Ventilation System*

## Overview

- Developed by Melink Corporation
- Commercialized in 1994
- Over 1800 units sold

## Energy Savings

*(Trillion Btu)*

| Cumulative through 2003 | 2003 |
|---|---|
| 0.369 | 0.159 |

## Emissions Reductions

*(Thousand Tons, 2003)*

| Particulates | $SO_X$ | $NO_X$ | Carbon |
|---|---|---|---|
| 0.001 | 0.034 | 0.026 | 3.13 |

## Applications

Commercial kitchen ventilation systems for restaurants, schools, hospitals, hotels, and other institutions

## Capabilities

- Monitors and reduces the fan speed during idle periods of kitchen activity to save energy.
- Provides sensors that monitor heat and smoke levels for safety.

## Benefits

The main benefit of upgrading the hood system with variable-speed controls is energy savings. Other benefits include improved kitchen comfort, energy-efficiency, occupant health, and fire safety.

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